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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/025,465	12/26/2001	Toshiyuki Kambe	PNDF-01211	2962

466 7590 04/17/2003

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EXAMINER

LIN, TINA M

ART UNIT	PAPER NUMBER
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2874

DATE MAILED: 04/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/025,465

Applicant(s)

KAMBE, TOSHIYUKI

Examiner

Tina M Lin

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A-SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12 is/are allowed.
- 6) ☒ Claim(s) 1-4, 7 and 10 is/are rejected.
- 7) ☒ Claim(s) 5, 6, 8, 9, and 11 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,483,609 to Nakaya. Nakaya discloses an optical waveguide device with a substrate (11), at least one optical waveguide in the substrate (12), a first thin film layer (25) containing an oxide to be placed over the waveguide in the substrate, and a second thin film layer (26) on top of the first thin film layer. Furthermore, Nakaya discloses a protective film formed over the exposed surfaces of each of the thin film layers. (Figure 6) But Nakaya fails to mention the thin film layers to be conductive. However, conductive thin films are well known in the art of imbedded waveguide structures and would have been obvious at the time the invention was made to a person having ordinary skill in the art to have further specified the thin film layer to be used in the waveguide device to have a conductive property.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,483,609 to Nakaya as applied to claim 1 above, and further in view of U.S. Patent 6,400,881 B1 to Seino et al. Nakaya discloses all of the above, but Nakaya fails to disclose the first thin film layer to contain indium oxide. Nakaya only discloses the first thin film layer to contain

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silicon dioxide. However, Seino et al. does disclose an optical waveguide device with a thin film layer, where the thin film layer is silicon dioxide. Seino et al. further discloses indium oxide to be added to the silicon dioxide in the thin film layer. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have a thin film layer to contain indium oxide.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,483,609 to Nakaya as applied to claim 1 above, and further in view of U.S. Patent Application US2002/0123158 A1 to Murai. Nakaya discloses all of the above, but Nakaya fails to disclose the second thin film layer to contain chromium. However, Murai discloses a thin film device that can function as waveguide type modulators. As disclosed by Murai, the thin film device is capable of manufacturing a thin film that contains chromium. Therefore, since both are from the same field of endeavor, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have used a thin film layer that contained chromium in an optical waveguide device.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,483,609 to Nakaya as applied to claim 1 above, and further in view of U.S. Patent Application US2002/0123158 A1 to Murai and U.S. Patent 5,193,130 to Nishiwaki et al. Nakaya discloses all of the above, but fails to disclose the first thin film layer to contain indium tin oxide and the second thin film layer to contain chromium. However, Nishiwaki et al. discloses a waveguide device that includes a conductive thin film layer made of indium tin oxide. Furthermore, Murai discloses a thin film device is capable of manufacturing a thin film that contains chromium. Since both Nishiwaki et al. and Murai are both from the same field of endeavor, it would have

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been obvious at the time the invention was made to a person having ordinary skill in the art to have used a thin film layer to contain indium tin oxide and another thin film layer to contain chromium in an optical waveguide device.

Allowable Subject Matter

Claims 5, 6, 8, 9, and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. In regards to claims 5, 6, 9 and 11, the prior art of record fails to disclose or reasonably suggest an optical waveguide device with a substrate, at least one optical waveguide in the substrate and three conductive thin film layers. The closest prior art of record is U.S. Patent 5,483,609 to Nakaya discloses an optical waveguide device with a substrate, at least one optical waveguide in the substrate and two thin film layers. Nakaya fails to disclose or reasonably suggest a third conductive thin film layer. In regards to claim 8, the prior art of record fails to disclose or reasonably suggest an optical waveguide device with a lithium niobate substrate, optical waveguides in the substrate to form Mach-Zehnder type couplers and a phase shifter formed between the couplers. The closest prior art of record is U.S. Patent 5,483,609 to Nakaya discloses an optical waveguide device with a lithium niobate substrate and a Mach Zehnder coupler, but fails to disclose a phase shifter formed between the Mach Zehnder couplers.

Claim 12 is allowed. The prior art of record fails to disclose or reasonably suggest a process to produce an optical waveguide structure comprising all of the steps as disclosed by applicant. The closest prior art of record is U.S. Patent 5,483,609 to Nakaya discloses a process of producing an optical waveguide structure but fails to disclose an indium oxide thin film layer,

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forming a photoresist mask and forming a chromium thin film thinner than the indium oxide layer.

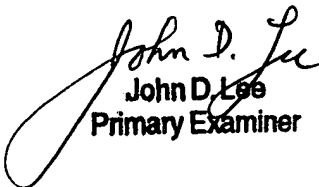
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References E-I discuss optical waveguide devices and modulators with a waveguide formed within the substrate. None of the references cited by the examiner disclose or reasonably suggest the allowable subject matter as discussed above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tina M Lin whose telephone number is (703) 305-1959. The examiner can normally be reached on Monday-Friday 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (703) 308-4819. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

TML 
April 12, 2003


John D. Lee
Primary Examiner